Psychology 6335
Spring 2017

Multilevel Modeling

Instructor: Osvaldo F. Morera, PhD
Office: Room 212, Psychology Building
Phone 747-5417
Office hrs: Wednesdays from 9:45 am -11:45 am.
Email: omorera@utep.edu
Lectures: 10:30 pm – 11:50 pm, UGLC 336
Texts:

Snijders, T. & Bosker, R. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*, 2nd Edition. Thousand Oaks, CA: Sage.

Heck, R. H., Thomas, S.L. & Tabata, L.N. (2014). *Multilevel and Longitudinal Modeling with IBM SPSS (2nd edition)*. New York: Routledge.

Selected chapters from Neter, Wasserman & Kutner on fixed effects ANOVA (Model I), Random effects ANOVA (Model II), and mixed effects ANOVA (Model III).

Other Readings (for now)

Centering in MLM

Enders, C.K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods, 12*, 121-138.

Lüdtke, O., Marsh, H.W., Robitzsch, A., Trautwein, U., Asparouhov, T., & Muthén, B. (2008). The multilevel latent covariate model: A new more reliable approach to group level effects in contextual studies. *Psychological Methods, 13*, 203-229.

Repeated Measures as MLM Models

Gueorguieva, R. & Krystal, J.H. (2004). Move Over ANOVA: Progress in Analyzing Repeated Measures Data and its Reflection in Papers Published in the Archives of General Psychiatry. *Archives of General Psychiatry, 61*, 310-217.

Hoffman, L., & Rovine, M.J. (2007). Multilevel models for the experimental psychologist: Foundations and illustrative examples. *Behavior Research Methods, 39*, 101-117.

Locker Jr., L., Hoffman, L., & Bovaird, J. A. (2007). On the use of multilevel modeling in the analysis of psycholinguistic data. *Behavior Research Methods, 39*, 723-730.

Multilevel Mediation

Preacher, K.J., Zyphur, M.J., Zhang, Z. (2010). A general multilevel model SEM framework for assessing multilevel mediation. *Psychological Methods, 15*, 209-223.

Prerequisites:

I assume that you have knowledge of Psychology 6307 and Psychology 6308 prior to taking this course. I may talk about multilevel mediation and that may require some knowledge of latent variable modeling, but Psych 6302 or 6323 is not a prerequisite for the class.

Course objectives/Learning Objectives:

Data in the social and applied sciences are often "nested" or "clustered" or have a multilevel structure. For example, jurors are nested within juries; patients are nested within doctors; students are nested within classroom (which are then nested in schools, that are nested in school districts,that are nested in counties that are nested in states). Measurements of attributes or characteristics of juries (time to deliberate) and jurors (age, sex, individual difference measures like legal authoritarianism) may also be available. Repeated measures data and longitudinal data are also multilevel data, as they are nested within person.

Most standard statistical models assume the independence observations (or independence of errors). When data have a multilevel structure, observations are typically correlated. In other words, the standard independence assumption is violated and are statistical testing procedure becomes very liberal. For example, jurors make decisions after lengthy deliberations. Undoubtedly, their verdicts are influenced by other jurors.

This course provides an introduction to the use of multilevel models that take into account dependencies between observations. You will learn the basic ideas of multilevel modeling and you have a chance to apply these techniques to data that your group has for a class project (as well as data that I will ask you to analyze on homework assignments).

Topics that will be covered include knowing the difference between fixed effects and random effects ANOVA models. An introduction to multilevel analyses, random intercept and slope models, 2 level models, centering, hypothesis testing, model assessment, power analysis for designing multilevel studies, probing interactions and longitudinal (repeated measures) data and 3 level models. Time permitting, I will talk about cross-classified data, models for dichotomous responses, and the assessment of mediation in multilevel modeling and power analysis. At the minimum, you will have a solid understanding of multilevel modeling and we should get through what Snijders & Bosker (2012) would consider sufficient for an introductory course (Chapters 1-6 and 7.1).

Computing:

We will primarily be using SPSS and M*Plus*. I will also talk about PRELIS/LISREL in the early portion of the class. Due to the recent upgrade in LISREL to Version 9.1, I may spend more time using SPSS or I will bring my laptop to class and use LISREL 8.8. The following machines in Room 105 have LISREL 8.8 and MPlus on them: dbvlab18, dbvlab20, dbvlab21 and dbvlab23.

Evaluation:

Students will be evaluated on the basis of a small number of group project homework assignments (40% of the grade), at least one in class quizzes (10% of grade), group presentation (15% of the grade) and a group class paper written in APA format (35% of the grade).

Policy on Auditors

Student and faculty auditors are welcome in the class, as long as they complete the required university audit form. However, my first priority is to the students who are registered for the class. Students in the class get first dibs on seats in the class. In addition, if we were to ever wind up in the Room 105 and seating in the room becomes a problem, registered students get first dibs on the 4 machines with MPlus/LISREL. I also ask that auditors not submit any homework assignments or take any exams, as it is extra work on my part and the TA's part. If your attendance becomes sporadic, I expect that you will not slow down the class questions that were covered in prior lectures.

In short, your completion of the university audit form allows you the privilege of listening to the course material (and that is all). If your attendance requires additional time of my TA, additional time of myself or takes away from the learning experience from the registered students in the class, you should not audit this class.

Course structure and requirements:

1. Students will be responsible for all material covered in lectures, class handouts and assigned readings. With regard to lectures, there is no such thing a stupid question (in most cases). If you have a question, someone else probably has that same question. Feel free to ask any questions.

2. A calculator is still highly recommended. It should perform all basic mathematical operations and should have several memories.

3. There will between 4 - 8 homework assignments (probably 6, we'll see). Many of the homework assignments will require the use of statistical software. We will use SPSS and MPlus in this class. As stated above, we may also use LISREL.

4. Please turn off all pagers, beepers and other electronic devices before entering class. They are a distraction to other students in the class and to the professor.

5. Office Hours and Appointments: If you have questions concerning the topics of this course, you can stop by to see me during my office hours or please do not hesitate to make an appointment to see me. If you stop by my office and you do not have an appointment to see me, I will ask you to schedule an appointment to see me and I will answer your question during that appointed time. This policy also applies to "questions that will only take a minute to answer."

6. Conduct of Graduate Students: Students enrolled in this course are graduate students and I have certain expectations of graduate students. As you are pursuing an advanced professional degree, I expect that you will act in a professional manner. Asking for extensions on assignments because you are busy with other courses/projects/papers is not professional. In addition, I also expect that you will show respect to everyone in the class.

7. Academic Misconduct: The Department of Psychology follows the university policy on academic honesty that is published in the Undergraduate College-Academic Regulations and is available to all members of the University community. Additional information on academic misconduct can also be found at the following links:

http://studentaffairs.utep.edu/Default.aspx?tabid=4386

http://admin.utep.edu/Default.aspx?PageContentID=2084&tabid=30292

This policy represents a core value of the University and all members of the university community are responsible for abiding by its tenets. Lack of knowledge of this policy is not an acceptable defense to any charge of academic dishonesty. The University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their own work, for the appropriate citation of sources and for respect of others' academic endeavors.

In other words, plagiarism, cheating and academic dishonesty will not be tolerated in this class. Plagiarism consists of using another person's ideas, words, or assistance, while failing to acknowledge this person. If you must submit someone else's work as if it were you own, you must acknowledge the original author/original source. If I suspect any incidence of academic dishonesty, plagiarism, collusion, cheating, etc. on any class assignment or exam, I will be more than happy to forward suspected material to the Office of the Dean of Students.

8. Accommodations for Students with Disabilities: If you have an identified disability that may affect your performance in this class, please see the instructor (no later than the end of the first class) or contact the Disabled Student Services Office in Room 106

of the Student Union (phone 747-5148) such that provisions can be made to ensure that you have an equal opportunity to meet all the requirements of this course.

Important Dates to Remember

Wednesday, February 1	Census Day; Last day to drop course without "W" appearing on transcript
Tuesday, February 7	Fixed effects/random effects ANOVA quiz
Friday, February 12	Pass/Fail Grade Option Selection Deadline
March 13 – March 17	Spring break
Friday, March 30	Course drop deadline
Thursday, May 4	Last Day of our class
Friday, March 5	Class projects due
Wednesday, May 17	Grades due to Records Office

Tentative Course Schedule

Psychology 6335
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Tentative Course Schedule

Date	Topic	Reading
1/17, 1/19	Fixed and random effects ANOVA, matrix algebra	NWK chptrs.
1/24	Review of OLS regression	Class notes
1/26, 1/31	Intro to multilevel modeling and empty model	Chapters 1-3
2/2 – 2/9	Random intercept model, random slope model Exploring variability	Chapter 4, 7
2/7	**Fixed and random effects ANOVA in class quiz**	
2/14 - 2/16	Centering in MLM	Chapter 5
	INITIAL PROJECT PROPOSAL, DUE 2/16	
2/16	Estimation methods	Chp. 4, 5, 10
2/21 – 2/28	Inference for fixed effects, random effects, model evaluation and testing model assumptions Probing interactions in multilevel models	Chapters 6,9
3/7 – 3/23	Longitudinal models	Chapter 15
3/14 - 3/16	**SPRING BREAK**	
3/23 – 3/30	Repeated measures	Chapter 15 and Hoffman papers
4/4 - 4/11	Power analysis, 3 level models	Chapter 5, 11
4/13 - 4/20	Cross-classified models, multivariate multilevel models and multilevel logistic regression	Chp 16, 17
4/25 – 4/27	Group presentations	
5/2 - 5/4	Multilevel mediation, multilevel SEM	Preacher papers
	FINAL PROJECT DUE, MAY 5	